

OBSERVATIONS ON PREDATORS OF SERICOTHrips VARIABILIS BEACH (THYSANOPTERA)¹

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During the summer of 1971, as part of a research program by the Illinois Soybean Entomology Team on insects and other arthropods associated with soybeans, investigations were made on host-prey relationships of some of the organisms involved. Of these, the principal thrips, *Sericothrips variabilis* (Beach), a common feeder on soybean leaves, attracted a number of predators—Acarina, Hemiptera, Diptera, Neuroptera, and Thysanoptera, of which *Aeolothrips fasciatus* (Linnaeus) (Aeolothripidae: Thysanoptera) and *Orius insidiosus* (Say) (Anthocoridae: Hemiptera) were most often encountered. The development or reactions of these two main predators to the thrips are briefly noted herein.

OBSERVATION CHAMBERS

The host thrips and predators were collected from local soybean fields in Champaign County, Illinois, and transferred to glass tubes with a strip of soybean leaf as the substrate. These rearing chambers were modified from those described by Pelikán (1951) and consisted of 10.8×2 cm glass tubes, closed by a moist cotton plug which held the base of a strip of soybean leaf cut to 7.6×1 cm and centered in the tube. The tubes were laid flat to allow the thrips and predators to orient naturally to the lower surface of the leaf. The leaf strips usually remained fresh for one week after which they were renewed.

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Care was given to prevent excessive moisture in the tubes to avoid entrapment of the thrips and impairment to observations of them.

***Aeolothrips fasciatus* (Linneaus)**

This introduced European predator is frequently collected in legume fields in the northern half of Illinois. As has been reported by Derveney (1967) for its congener, *Aeolothrips intermedius* Bagnall, larvae of *A. fasciatus*, most probably, can temporarily sustain life by feeding on plant juices but feeding on other insects is necessary for further development and spinning the pupal cocoon. Actual feeding on other thrips was never observed directly, but the two larvae of *A. fasciatus* reared to the adult stage were presumed to be responsible for the gradual disappearance of the host thrips larvae during confinement in the rearing tubes.

On July 15, the first cocoon of *A. fasciatus* was observed in a rearing chamber in which one larva II of *A. fasciatus* had been previously placed with larvae of *S. variabilis*. The cocoon, Fig. 1, was attached to the main vein of the upper surface of the soybean leaf. It was



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FIG. 1. Completed cocoon of *Aeolothrips fasciatus* (Linneaus) on soybean leaf. FIG. 2. First layer of cocoon of *Aeolothrips fasciatus* (Linneaus) showing tip of abdomen of larva raised in spinning silk from anus. Photographs by Wilner Zehr, Illinois Natural History Survey, Urbana.

slightly over 1.5 mm in length, white in color with the yellow larva faintly showing through. Movement within the cocoon was noted the following day, July 16, possibly in response to the slight disturbance made during inspection of the tube. By July 23, the then-formed pupa showed a black color beneath the white silk. An adult female of *A. fasciatus* emerged over the weekend of July 24-25, and was found dead, July 26, nearby a few remaining, living larvae of *S. variabilis*.

Another larva II of *A. fasciatus* was observed to spin a cocoon on July 22-23. It also selected a site on the upper side of the soybean leaf alongside the main vein. During the spinning process the larva was very active moving both the anal and head ends. Apparently the silk was emitted from the anus as the terminal abdominal segments moved from one guy thread to the next, and the abdomen was often arched over the body in the process, Fig. 2. From time to time the larva seemed to comb or arrange the silk by the fore legs. When disturbed the larva reversed its position within the forming cocoon. In constructing the cocoon, an outer layer was laid down with many threads being attached to the leaf. An inner layer was subsequently spun, obscuring the further activities of the larva. During the two days of cocoon building, the larva rested frequently. An adult female of *A. fasciatus* emerged on the weekend of July 31-August 1, and died the following day after possibly having eaten the remaining larvae of *S. variabilis*.

Kurdjumov (1913) was the first to report on the cocoon of *A. fasciatus*, in Russia, and Bailey (1940) discovered the cocoon of *A. fasciatus* on curled leaves of alfalfa in a laboratory in California. Apparently in Russia, *A. fasciatus* has two generations. If, as we observed, pupation and emergence take place regularly in July, there is ample time for two generations to occur in Illinois also.

Orius insidiosus (Say)

This anthocorid bug has been found commonly on soybean leaves, principally as nymphs and around flowers in other legumes as adults. In the fall of the year in central Illinois adults sometimes become so abundant in gardens as to become a serious nuisance biting people or congregating on late-bearing raspberries.

On July 7, in one observation chamber an adult anthocorid was

introduced to larvae of *S. variabilis*, whereupon the bug immediately ran over to a larva, inserted its mouth parts or beak against the central portion of the dorsum of the thrips, holding it thus securely. The bug walked and even flew with the thrips impaled on the bug's beak. In the process of feeding on the thrips, the anthocorid used the fore legs only to adjust the non-struggling thrips for additional punctures. Secondly the bug inserted the mouth parts in the dorsum of the abdomen and later in the head. Finally the anthocorid turned over the larva by means of the fore legs, as one might handle an ear of corn, and inserted the beak in several areas of the venter of the thrips, thereafter abandoning the dead, crumpled, now colorless thrips larva.

In a repeated observation, using an adult anthocorid and an adult female of *Frankliniella tritici* (Fitch), the bug showed similar behavior of initially penetrating with the mouth parts the junction of the thorax and abdomen and carrying the thrips entirely by the beak. Changes of position were always made with the fore legs and reinserting the mouth parts, eventually to the head and abdomen before abandoning the dead empty body of the thrips.

Nymphal anthocorids are usually found throughout the summer season with thrips on soybeans and may account for the reduced number of thrips larvae on the upper leaves of soybeans where these bugs seem most numerous.

Melis (1935) recorded nymphs of an anthocorid, *Ectemnus reduvinus*, feeding on adult thrips in Italy. Miller (1956) mentions that the anthocorid *Montandoniola moraguesi* Puton is predacious on the fig thrips (*Gynaikothrips ficorum* Marchal) presumably in tropical regions. According to Froeschner (1949) *Orius insidiosus* feeds on aphids, caterpillars, and other soft-bodied insects. Thrips have not been previously listed as hosts of *O. insidiosus* to our knowledge.

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2.0150 Observations on predators of *Sericothrips variabilis* Beach.

ABSTRACT: Larva II of *Aeolothrips fasciatus*, which apparently feeds on *Sericothrips variabilis* in soybean fields, spins a double layered cocoon (illustrated by photographs) for pupation. *Orius insidiosus*, an anthocorid bug, also feeds on *S. variabilis*.—Allen G. Robinson, Lewis J. Stannard, Jr., and Edward J. Armbrust, Illinois Natural History Survey, Urbana IL 61801.

Descriptors: Thysanoptera; Thripidae; *Sericothrips variabilis*, prey of Aeolothripidae; *Aeolothrips fasciatus*, larva II, and cocoon; prey of Hemiptera; Anthocoridae; *Orius insidiosus*, prey on thrips.